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EXAMINER

DUONG, THOI V

ART UNIT PAPER NUMBER

2871

DATE MAILED: 10/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/084,989

Applicant(s)

WANG, CHENG CHI

Examiner

Thoi V Duong

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 July 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,5-8,10,12,17,18 and 21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,5-8,10,12,17,18 and 21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to the Amendment, Paper No. 3, filed July 31, 2003.

Accordingly, claims 1, 6-8, 10, 12, 17 and 18 were amended, claims 3, 4, 11, 13-16, 19 and 20 were cancelled, and new claim 31 was added. Currently, claims 1, 2, 5-8, 10, 12, 17, 18 and 21 are pending in this application.

Claim Rejections - 35 USC § 112

2. Claims 12 and 21 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. It is unclear how a visible light reflectance greater than 95% or 97% can be obtained with an Ag-Al alloy contains about 10 at% of silver as recited in claims 12 and 21. According to USPN 5,986,204 of Iwasaki et al., as shown in Fig. 5, the reference of Iwasaki et al. only discloses that the maximum reflectivity of 86% is obtained for an Ag-Al alloy having about 7 at% of silver and a reflectivity of greater than 95 or 97% can be obtained for the Ag-Al alloy having about 90 at% of silver.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 2, 5, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaneko et al. (USPN 6,433,842 B1) in view of Jeong et al. (USPN 6,486,514 B2) and further in view of Iwasaki et al. (USPN 5,986,204).

As shown in Fig. 1, Kaneko et al. discloses a thin film transistor (TFT) panel comprising:

- a gate line with a gate electrode 2, 3 on a substrate 1;

- a gate insulating layer 4 on the gate line;

- a semiconductor layer 5 on the gate insulating layer;

- a conductive pattern layer with source and drain electrodes spaced apart on the semiconductor layer, the conductive pattern layer comprising a first molybdenum layer 7, an Al alloy layer 8 on the first molybdenum layer and a second molybdenum layer 9 on the Al alloy layer (col. 7, lines 52-58);

- a passivation layer 10 on the semiconductor layer and the conductive pattern layer, the passivation layer having a plurality of contact holes 19; and

- a plurality of pixel electrodes 11 on the passivation layer, each of the pixel electrodes extending into one of the contact holes to contact the molybdenum layer 9,

wherein the gate line comprises an Al alloy layer 2 on the substrate and a molybdenum layer 3 on the Al alloy layer (col. 7, lines 17-23).

Kaneko et al. discloses a TFT panel that is basically the same as that recited in claims 1, 2, 5, 17 and 18 except that the alloy layer is not an Ag-Al alloy layer. As shown in Figs. 9 and 10, Jeong et al. discloses that a gate line 22 and a data line 62 with a source electrode 65 and a drain electrode 66 spaced apart on a semiconductor layer

Art Unit: 2871

40, are formed of an Ag-Al alloy (col. 8, lines 28-34 and col. 9, lines 1-15). Jeong et al. teaches that the Ag-Al alloy bears low resistance, low melting point and good adhesion characteristics while the Al alloy bears a weak physical or chemical characteristics and erodes easily at the contacting area, when contacting other conducting materials (col. 1, lines 24-40). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the TFT panel of Kaneko with the teaching of Jeong et al. by employing an Ag-Al alloy for the gate line and the conductive pattern layer so as to provide reliability to the display due to a low resistance and good adhesion characteristics of the alloy.

The TFT panel of Kaneko et al. as modified in view of Jeong et al. above includes all that is recited in claims 1, 2, 17 and 18 except for the atomic percentage of silver in the Ag-Al alloy. As shown in Figs. 1 and 5, Iwasaki et al. discloses a reflecting layer 102 comprising an Ag-Al alloy having a content of silver equal to or less than 30 atomic% (col. 4, lines 19-23 and col. 5, lines 26-48) so as to obtain a reliable device due to high reflectivity and migration resistance of the reflecting layer (col. 4, lines 24-31). Fig. 5 also indicates that the reflectivity has a maximum value in the vicinity of 7 at% of Ag. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the TFT panel of Kaneko with the teaching of Iwasaki et al. by forming an Ag-Al alloy containing about 5 to about 10 at% of silver for improving reflectivity as well as migration resistance for the display.

5. Claims 6-8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Park et al. (USPN 6,466,280 B1) in view of Iwasaki et al. (USPN 5,986,204).

Art Unit: 2871

As shown in Figs. 5A-5D and 6, Park discloses a liquid crystal display, comprising:

- a top plate comprising a transparent electrode;

- a bottom plate 1 comprising reflective electrodes 68; and

- a liquid crystal layer sandwiched between the top plate and the bottom plate (col. 2, lines 54-57),

wherein an image is generated by the liquid crystal display when ambient light 110 is incident to the surface of the top plate (Fig. 6).

The liquid crystal display further comprises a light source below the bottom plate (col. 2, lines 54-57) wherein each of the reflective electrodes has at least one aperture 72 defined therein such that an image is generated by the liquid crystal display when light 112 from the light source passes through the apertures of the reflective electrodes.

- wherein the bottom plate further comprises (see Fig. 1):

- a plurality of parallel gate lines 6, 8;

- a plurality of parallel data lines 2, 4 formed perpendicular to the gate lines, the gate lines and the data lines being arranged to form a matrix of pixel regions with each of the pixel regions bounded by two adjacent gate lines and two adjacent data lines; and

- a plurality of thin film transistors S formed at intersections between the gate lines and data lines,

wherein each of the reflective electrodes is respectively disposed in one of the pixel regions and functions as a pixel electrode (col. 4, lines 64-67).

Art Unit: 2871

The liquid crystal display of Park et al. includes all that is recited in claims 6-8 and 10 except that the reflective electrodes are not formed of an annealed Ag-Al alloy which has been annealed at temperatures from about 200 degrees C to about 250 degrees C and contains about 5 to about 10 at% of silver. As shown in Figs. 1 and 5, Iwasaki et al. discloses a reflecting layer 102 comprising a thin film of Ag-Al alloy having a content of silver equal to or less than 30 at% (col. 4, lines 19-23 and col. 5, lines 26-44) so as to obtain a reliable device due to high reflectivity and migration resistance of the reflecting layer (col. 4, lines 24-31). Iwasaki et al. teaches that a high reflectivity is obtained when the content of Ag is 7 at% (col. 5, lines 45-48). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the TFT panel of Kaneko with the teaching of Iwasaki et al. by forming an Ag-Al alloy containing about 5 to about 10 at% of silver so as to improve the brightness of the display.

As to the product-by-process limitation "an annealed Ag-Al alloy which has been annealed at temperatures from about 200 degrees C to about 250 degrees C" of claim 6, it has been recognized that "Even through product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior art product was made by a different process". *In re Thorpe*, 227 USPQ 964,966 (Fed. Cir. 1985). See also MPEP 2113.

Response to Arguments

6. Applicant's arguments filed July 31, 2003 have been fully considered but they are not persuasive.

In response to applicant's argument that USPN 5,986,204 of Iwasaki et al. is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Iwasaki et al. discloses an Ag-Al alloy having a high reflectivity and improved migration resistance which is reasonably pertinent to the particular problem with which the applicant was concerned.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the reference of Jeong et al. is employed for teaching an Ag-Al alloy used for the gate line and the conductive pattern and the reference of Iwasaki et al. is relied on for teaching an Ag-Al alloy containing about less than 30 at% of silver to provide reliability and improve the brightness for the display.

Finally, with respect to claim 6, since the limitation "an annealed Ag-Al alloy which has been annealed at temperatures from about 200 degrees C to about 250 degrees C" recited in the claim is a process of fabricating an Ag-Al alloy, this limitation has not been given patentable weight.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thoi V. Duong whose telephone number is (703) 308-3171. The examiner can normally be reached on Monday-Friday from 8:00 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim, can be reached at (703) 305-3492.

Application/Control Number: 10/084,989

Page 9

Art Unit: 2871

Thoi Duong



10/17/2003



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